UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
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OFFICE OF
ENVIRONMENTAL
CLEANUP

DATE: March 30, 2016

SUBJECT: Action Memorandum for the Cottage Grove Mercury Emergency Response Site, Cottage Grove, Lane County, Oregon

FROM: Jeffrey A. Fowlow, On-Scene Coordinator
Emergency Preparedness and Prevention Unit
Emergency Management Program

THRU: Calvin J. Terada, Manager
Emergency Response Unit
Emergency Management Program

4.1.16

TO: Administrative Record
Cottage Grove Mercury Response

I. PURPOSE

The purpose of this Action Memorandum is to document the decision to initiate the emergency response action described herein for the Cottage Grove Mercury Emergency Response Site (the "Site") which is located in Cottage Grove, Lane County, Oregon.

II. SITE INFORMATION

A. Site Description

Site Name:	Cottage Grove Mercury Emergency Response
Superfund Site ID (SSID):	10PP
NRC Case Number:	
CERCLIS Number:	ORN001001560
Site Location:	(b) (6) Cottage Grove, Oregon 97424
County:	Lane
Lat/Long:	latitude: 43 35 02.76, longitude: -123 04 12.04
Potentially Responsible Party (PRP):	See Confidential Enforcement Addendum
Access:	Written consent for access to the property was granted by the property owner on March 8, 2016. The property is fenced, but there is no gate nor signage restricting public access.
NPL Status:	Neither listed nor proposed for listing
Removal Start Date:	March 8, 2016

B. Site Background

1. Removal Site Evaluation

On March 7, 2015, one of the property owner was carrying a box of bottles from a storage shed when he tripped and dropped the box onto the floor of the carport. A bottle that contained mercury broke releasing the contents onto the carport's soil/gravel floor. The property owner also fell onto the floor and into the spilled mercury. Although the amount released is unknown, it was estimated to be 4-8 fluid ounces based on the size of

the broken bottle and information provided by the property owner. The property owner proceeded into the house and washed his hands in the bathroom and kitchen sinks, then got into his truck and drove to his sister's house and called Oregon Emergency Response System, who then contacted Oregon Department of Environmental Quality (ODEQ). ODEQ advised the property owner to remove and bag his clothing and to not drive his truck until it could be assessed for contamination. ODEQ also requested assistance cleaning up the spill from EPA.

EPA initiated work on Tuesday, March 8 along with its Superfund Technical Assessment and Response Team (START) contractors and Emergency and Rapid Response Services (ERRS) contractors. Upon arrival at the Site, the presence of visible mercury was confirmed by visual recognition of the mercury beads and by positive detection using a Lumex Model 915 mercury vapor analyzer (Lumex). Mercury is a hazardous substance as defined by the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § 9601(14). Affected areas included: the gravel/soil floor of the carport; the bathroom in the residence; the property owner's clothing and truck; and the sister's house. The positive identification of mercury released to the soil/gravel floor of the carport constitutes a release of a hazardous substance to the environment under the CERCLA, 42 U.S.C. § 9601(22). The positive identification of mercury in the residence, the property owner's truck, and the sister's residence constitutes a potential release of a hazardous substance under CERCLA because the residences, truck, and clothing could continue to be sources of future releases to the environment.

EPA contractors used a mercury vacuum to remove visible mercury beads and excavated contaminated soil in the carport, fixtures in the contaminated bathroom sink were removed and replaced, and the contaminated clothing was disposed of as debris. Cycles of heating and ventilation were used to reduce the low levels of mercury contamination in the truck and the second residence to below 1,000 nanograms per cubic meter (ng/m^3), the Agency for Toxic Substances and Disease Registry (ATSDR) recommended action level for normal occupancy in residential settings.

While on Site, additional containers of mercury, acids, and poisons were discovered and disposed. The acids (hydrochloric acid and nitric acid) and poisons (barium dioxide and unknown sulphur-based compound) were unsecured, improperly managed, and poorly labelled. The property owner was unaware of the risks associated with the chemicals and requested EPA to safely dispose of them. Additionally, EPA contractors consolidated the contents of approximately 25 rusted, damaged, and leaking drums/buckets of automotive fluids into 2 new over pack drums. ODEQ will arrange for transportation and disposal of the automotive fluids through their household hazardous waste program.

2. Physical Location

The spill location occurred in a residential rural area in Lane County, Oregon. The property structures include a house with car port and attached shed, an unattached shed, a work shop, and a Quonset hut. A truck, owned by the property owner, and his sister's house approximately 0.25 miles away also were part of the Site. The owner of the property has been identified and information is provided in the Site file.

3. Release or threatened release into the environment of a hazardous substance, pollutant or contaminant

Mercury, hydrochloric acid, nitric acid, barium dioxide (barium compounds), and sulphur (unknown sulphur-based compound) are hazardous substances as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

4. Pictures and other graphic representations

Refer to attached Figure 1 (Aerial Photograph) and Figure 2 (Unit 1 Floor Plan).

III. Threats to Public Health, Welfare or the Environment

A. Nature of Actual or Threatened Release of Hazardous Substances, Pollutants or Contaminants

The predominant threat to human health or welfare is the potential for exposure by inhalation of mercury vapors, although dermal contact with free mercury is also a serious threat to humans. Mercury beads were observed at the spill location in the carport. Mercury vapor concentrations were detected above background levels at four locations: the spill area in the carport, the primary residence, a secondary residence, and a vehicle. Furthermore, screening with the Lumex showed mercury vapor concentrations both at the spill site and on the property owner's clothing at 45,000 ng/m^3, and indoor air concentrations ranged from 300 ng/m^3 to 18,000 ng/m^3. These concentrations exceeded the suggested ATSDR action level of 1,000 ng/m^3 for normal occupancy in residential settings. ATSDR recommends that humans be immediately isolated from spilled mercury when a concentration exceeding 10,000 ng/m^3 is determined.[1]

B. Applicable factors (from 40 CFR § 300.415) which were considered in determining the appropriateness of a removal action.

1. Actual or potential exposure to nearby human populations, animals or the food chain from hazardous substances or pollutants or contaminants [300.415(b)(2)(i)].

Elemental mercury beads were observed at the Site. Mercury vapors were measured in the driveway and on the property owner's clothing at concentrations greater than 45,000 ng/m^3, the bathroom sink at the primary residence was up to 18,000 ng/m^3, and the secondary residence and vehicle both ranged from 1,000 to 3,000 ng/m^3.

Mercury primarily causes health effects when it is breathed as a vapor where it can be absorbed through the lungs. These exposures can occur when mercury is spilled or when products that contain mercury break and release mercury to the air, particularly in warm or poorly-ventilated indoor spaces. Dermal contact with free mercury is also a serious threat to humans. Mercury is known to cause irreversible damage to the developing nervous system. Most at risk are women who are pregnant or may become pregnant and nursing or young children. Other common health effects in adults include various neurological dysfunctions such as tremors, changes in vision, loss of hearing, muscle coordination, loss of sensation, and difficulties with memory.

Other substances that were disposed include hydrochloric acid, nitric acid, barium dioxide, and an unknown sulphur-based compound. These materials were abandoned by the previous property occupant and unwanted by the current occupant. Hydrochloric acid is highly toxic and may be fatal if inhaled, swallowed, or absorbed through the skin. Nitric acid is highly toxic and may cause severe injury, burns, or death. Barium dioxide (also known as barium peroxide) is toxic and may cause irritation to eyes and skin and damage to kidneys. Barium dioxide also is a strong oxidizer that may accelerate the burning of combustible materials. An unknown sulphur-based compound also was disposed as a precaution since its exact hazards could not be ascertained by field analysis.

2. The availability of other appropriate federal or state response mechanisms to respond to the release [300.415(b)(2)(viii)].

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[1] ATSDR, Action Levels for Elemental Mercury Spills, March 22, 2012

ODEQ requested assistance from EPA to conduct an emergency response and cleanup. There were no known, other appropriate federal or state response mechanisms capable of providing the appropriate resources in a prompt manner needed to address the potential human health threats described herein.

IV. Selected Removal Action and Estimated Cost

A. Situation and Removal Activities to Date

1. Current Situation

Operations began on Tuesday, March 8 and concluded on Saturday, March 12. One EPA OSC, four START contractors, and five ERRS contractors were on Site.

Mercury Spill and Cleanup: The carport, primary residence, secondary residence, vehicle, and personal clothing were all part of the mercury response and cleanup.

Carport - Visible beads of mercury were removed using a mercury vacuum. Contaminated soil was identified using the Lumex. An area approximately 15 feet by 15 feet was excavated to remove the contaminated soil. The depth of excavation ranged from approximately 3 to 29 inches below grade. Excavation was concluded when headspace analysis of soil samples, conducted using the Lumex as described in the Region 10 Mercury Response Module, indicated concentrations of mercury in soil samples (average: 370 ng/m^3) were less than 2-3 times background levels (average: 183 ng/m^3) and less than 6,000 ng/m^3. Approximately 3-5 cubic yards of soil were excavated and disposed. The excavated areas were backfilled with 3/4-inch minus pit run.

Primary residence, including bathroom sink - The property owner stated that he used the bathroom and kitchen sinks to wash his hands after he fell into the area of spilled mercury. The kitchen sink was screened and elevated concentrations of mercury were not detected. The drain in the bathroom sink also was screened and concentrations as high as 18,000 ng/m^{3}were detected. When the sink's drain and P-trap were removed, concentrations of mercury were reduced to less than 1,000 ng/m^3. A new P-trap and drain were installed.

Property owner's truck - The initial concentrations detected in the truck ranged from 1,000-3,000 ng/m^3 in the breathing zone. Individual areas of elevated concentrations were not detected. The property owner was advised to cyclically run the truck's heating system and then open the windows to ventilate. ERRS also used the mercury vacuum on the interior of the truck to attempt to remove tiny beads, if present, in the seat, steering wheel, and floor. After cycles of heating and ventilation and use of the mercury vacuum, screening of the truck interior indicated concentrations of mercury that were less than 1,000 ng/m^3.

Property owner's contaminated clothing - START screened the property owner's clothing which had been placed into a plastic bag. Lumex readings indicated concentrations as high as 45,000 ng/m^3. The property owner gave EPA permission to dispose of the contaminated clothing, rather than attempting to decontaminate the clothing.

Secondary residence - The property owner stated that after he fell into the spilled mercury, he drove to his sister's house to notify the Oregon Emergency Response System. EPA received permission from the sister to screen the areas within her home. Concentrations within the breathing zone ranged from 1,000-3,000 ng/m^3. The only individual area of elevated concentration of mercury was the rocking chair cushion (5,000 ng/m^3) where her brother had sat while placing the call to the Oregon Emergency Response System. EPA recommended disposal of the cushion or placement outside for ventilation, as well as additional heating and ventilation cycling in the

residence. On Friday, March 11, EPA returned to the sister's house and surveyed with the Lumex. All concentrations of mercury within the breathing zone were less than 1,000 ng/m^3.

Additional Chemicals: During the emergency response, the property owner reported that containers of mercury and other chemicals may be present in the detached storage shed, workshop, and Quonset hut on the property.

Detached storage shed - START located one 500 ml container of hydrochloric acid, one 500 ml container of nitric acid, and one 250 ml container of barium dioxide in the storage shed. EPA arranged for transportation and disposal of those chemicals.

Workshop and Quonset hut - START and ERRS inspected these buildings and recovered three mercury flasks. Each flask has a capacity of approximately 2.55 liters. One flask was approximately 40% full of mercury. The other two flasks were completely full of what appeared to be hydraulic oil at the surface, but with the potential of a separate phase of mercury or residual mercury. All three containers were re-sealed and shipped off as mercury/mercury waste for proper processing and disposal. START/ERRS also recovered a container of sulphur. START/ERRS noted several containers of various automotive fluids. The fluids were stored in up to 25 fifty-five gallon drums and five-gallon buckets. The containers were in very poor condition, rusted and leaking. ERRS combined all of the fluids into two new 85-gallon over pack drums. ODEQ agreed to arrange for transportation and disposal of the automotive fluids through their household hazardous waste program. The drums were stored in the locked Quonset hut pending pick up from ODEQ.

2. Removal Activities to Date

There are no other removal activities currently being performed by other government or private parties that have not been previously discussed.

3. Enforcement

See attached confidential enforcement addendum.

B. Removal Actions

1. Action Description

Indoors and Vehicle[2]

No visible mercury was observed indoors, although as a precaution the driver's area of the vehicle was cleaned with a mercury vacuum. Thereafter, the affected areas were screened using a Lumex. If the Lumex readings were less than the ATSDR suggested action level of 1,000 ng/m^3, no further action was necessary; however, if the readings exceeded the ATSDR action level, additional cleanup was conducted, such as application of a mercury decontamination solution (e.g., Merc-X or sulfur powder), heat and ventilation cycles, and/or additional vacuuming. Some contaminated objects, such as the P-trap and drain from the bathroom sink, were removed, disposed, and replaced with new items.

Out-of-Doors

[2] ATSDR set an action level of 3,000 to 6,000 ng/m^3 for unrestricted use in vehicles. However, for this response the more conservative action level of 1,000 ng/m^3 was applied due to the limited extent of contamination in the vehicle.

Wherever observed, visible mercury was cleaned using a mercury vacuum. Thereafter, the affected areas including gravel or soil were excavated to a total depth of 3 to 29 inches below grade. For the gravel or soil substrate, confirmation samples were collected from the bottom of the excavation and screened for mercury vapors using the methods outlined in the Region 10 Mercury Response Module. The soil samples were heated to approximately 86 degrees Fahrenheit and screened with a Lumex. According to the Response Module, the soil may be considered contaminated if the headspace mercury vapor concentrations are 2 to 3 times greater than concentrations of background samples; alternatively, a contamination threshold of 6,000 ng/m^3 can be used as determined by ATSDR. A total of 6 background samples were collected in addition to thirteen confirmation samples. All confirmation samples were below the aforementioned action levels outlined in the Region 10 Mercury Response Module.

Disposal of Mercury Contaminated Materials

All mercury contaminated materials were properly handled, packaged, and transported to an approved facility. The contaminated materials were disposed of at a facility in compliance with the Off-Site Rule set forth in the National Oil and Hazardous Substances Contingency Plan ("NCP") at 40 C.F.R. § 300.440.

The Mercury Export Ban Act of 2008 (MEBA) places additional restrictions on the disposal of mercury. Recovered elemental mercury was shipped to a temporary storage facility (Bethlehem Apparatus Company) as authorized under MEBA until construction of a permanent facility is approved by the Department of Energy. Mercury contaminated soil or debris, and mercury comingled with soil or debris, was disposed as hazardous waste D009 to Chemical Waste Management in Arlington, Oregon under CERCLA.

Best Management Practices

Temporary Best Management Practices were implemented during cleanup activities to protect workers and the public from short-term construction impacts such as fugitive dust and other similar potential impacts.

2. Contribution to Remedial Performance.

This removal action is expected to be the final removal action for the Site. However, if future actions are required, the emergency removal described herein will not impede those actions based upon available information.

3. ARARs

The NCP requires that removal actions attain Applicable or Relevant and Appropriate requirements (ARARs) under federal or state environmental or facility siting laws, to the extent practicable (40 CFR § 300.415(j)). In determining whether compliance with ARARs is practicable, EPA may consider the scope of the removal action and the urgency of the situation. The following are requirements that may be ARARs for this removal.

Federal ARARs:

Resource Conservation and Recovery Act (RCRA) [42 U.S.C. § 6901], Subtitle"C" - Hazardous Waste Management [40 C.F.R. Parts 260 to 279]. Federal hazardous waste regulations specify hazardous waste identification, management, and disposal requirements. For the management of RCRA hazardous wastes that are not Bevill-exempt, applicability of Subtitle C provisions depend on whether the waste are managed within an Area of Contamination (AOC). 55 FR 8760 (Mar. 8, 1990). Applicable or relevant and appropriate requirements of RCRA Subtitle C (or the state equivalent) may be satisfied by off-site disposal, consistent with the Off-Site Rule, 40 C.F.R. § 300.440. RCRA Subtitle C also provides treatment standards for debris contaminated with

hazardous waste ("hazardous debris"), 40 C.F.R. § 268.45, although the lead agency may determine that such debris is no longer hazardous, consistent with 40 C.F.R. § 261.3(f)(2), or equivalent state regulations.

Mercury Export Ban Act (MEBA) of 2008. The Mercury Export Ban Act of 2008 (MEBA) amends the Toxic Substances Control Act (TSCA) to prohibit the export of elemental mercury from the United States effective 1 January 2013. MEBA also prohibits the sale, distribution, or transfer of elemental mercury under the control or jurisdiction of federal agencies to any other federal, state, or local government agency or to any private individual or entity, except for the transfer of elemental mercury to facilitate storage under MEBA.

State ARARs:

Oregon Environmental Cleanup Rules (OAR 340-122) are potentially applicable for the establishment of cleanup levels and the selection of response actions for soil at the Site. OAR 340-122-0040(2) requires that hazardous substance response actions achieve one of four standards: 1) acceptable risk levels, 2) generic soil numeric cleanup levels, 3) remedy-specific cleanup levels provided by ODEQ as part of an approved generic remedy, or 4) background levels in areas where hazardous substances naturally occur. The Oregon Hazardous Substance Remedial Action Rules require consideration of treatment of hot spots to the extent feasible (OAR 340-122-0040).

Oregon Hazardous Waste Regulations and federal RCRA (40 CFR Parts 260 to 268; OAR 340-100 to 340-106). Federal regulation promulgated under RCRA, and corresponding state law, provide standards for the identification, management, and disposal of solid and hazardous waste. The regulations pertaining to determining whether a waste is hazardous are potentially applicable, and if any waste is determined to be hazardous, then requirements relating to disposal will be ARARs.

Oregon Solid Waste Management Rules (OAR 340-093 through -097) are potentially applicable to any treatment and disposal of solid waste that may be generated at the Site during conduct of the response action.

Oregon General Emission Standards for particulate Matter (OAR 340-208-0100 through -210) are potentially applicable to visible emissions and nuisance conditions that may be generated by conduct of the cleanup action.

To-be-Considered Materials:

To-be-Considered Materials (TBCs) are non-promulgated advisories or guidance issued by Federal or State governments that are not legally binding, and do not have the status of potential ARARs. However, in many instances TBCs may be considered along with ARARs in determining the level of cleanup for protection of health or the environment.

EPA/ATSDR Guidance Document for Mercury Vapor Action Levels

Per EPA/ATSDR guidance, ambient conditions in residences should not exceed 1,000 ng/m^3 of mercury near the surface of the floor or in child or adult breathing zones. At or below this level, normal occupancy for even the most sensitive persons is acceptable, assuming normal conditions of use. ATSDR recommends headspace readings for belongings that may have been contaminated by vapors from a mercury spill that are in the range of 3,000 to 6,000 ng/m^3 of mercury be considered protective of human health. Measurements should be taken at the vents of appliances or headspace of bags containing the belongings being evaluated. Bags should be warmed passively to ambient conditions and appliances/electronics should be at operating temperatures. EPA/ATSDR criteria for use of family vehicles under normal conditions is 3,000 to 6,000 ng/m^3 of mercury. Exposure duration in most vehicles is short compared with other settings, allowing a higher concentration as the floor of this range.

The ceiling of the range is based on the presumption that liquid mercury may still be present but not yet discovered.

4. Project Schedule

EPA and its response contractors mobilized to the Site on March 8, 2016, and completed all removal actions on March 12, 2016.

C. Estimated Costs*

Contractor costs (ERRS/START staff, travel, equipment)	$144,900
Other Extramural Costs (Strike Team, other Fed Agencies)	$0
Contingency costs (10% of subtotal)	$14,490
Total Removal Project Ceiling	$159,390

* EPA direct and indirect costs, although cost recoverable, do not count toward the Removal Ceiling for this removal action. Liable parties may be held financially responsible for costs incurred by the EPA as set forth in Section 107 of CERCLA.

VI Expected Change in the Situation Should Action be Delayed or Not Taken

A delay in action or no action at this Site would have increased the actual or potential threats to the public health and/or the environment.

VII Outstanding Policy Issues

None.

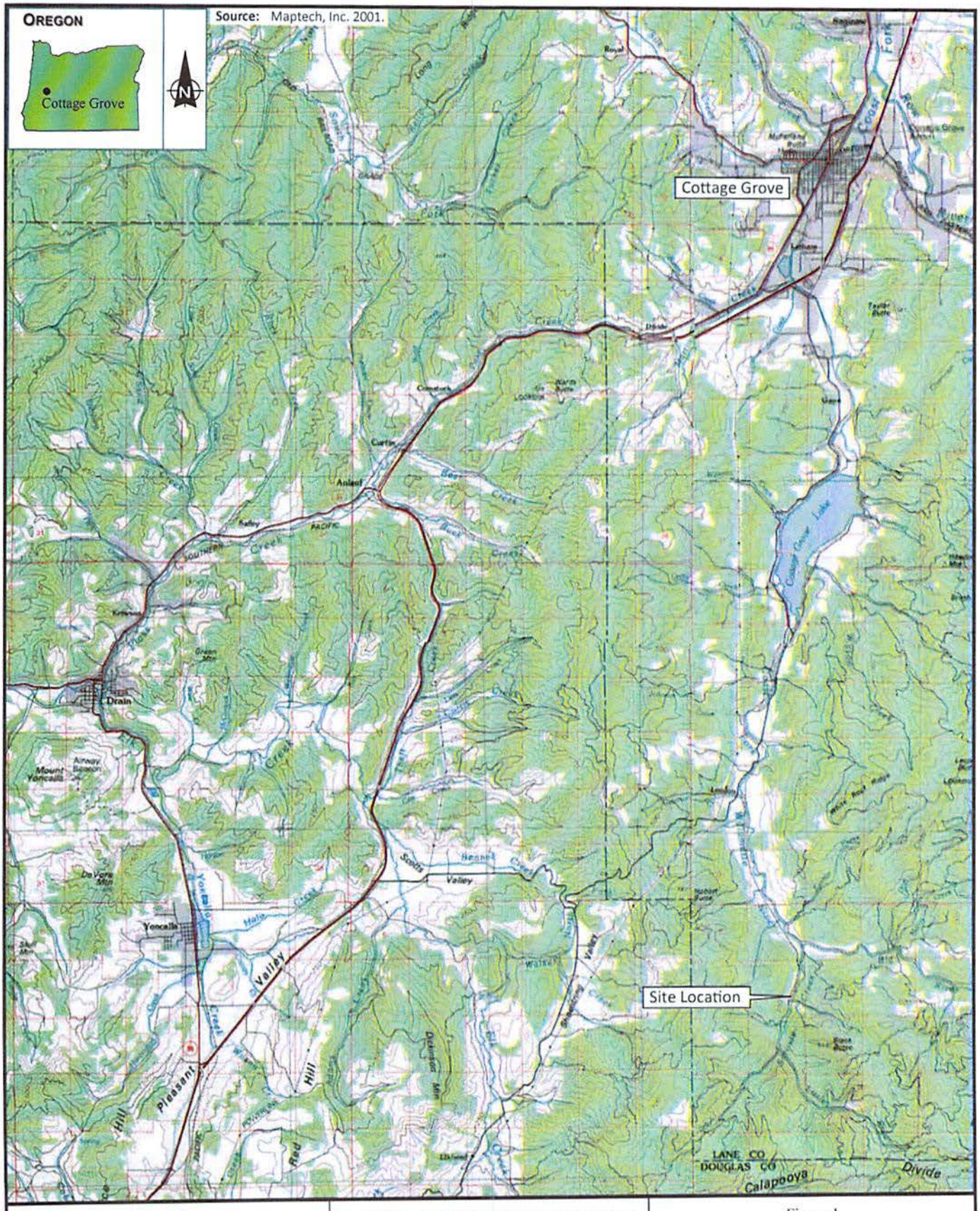
VIII Approvals

This decision document represents the selected removal action for this Site, developed in accordance with CERCLA, and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the administrative record for the Site.

Conditions at the Site meet the NCP Section 300.415(b) criteria for a removal action, and through this document I approved the removal action described herein. The total project ceiling is $159,390. Of this, as much as $159,390 comes from the Regional removal allowance.

Jeffrey Fowlow
Federal On-Scene Coordinator

4/1/2016
Date



ecology and environment, inc. Global Environmental Specialists Seattle, Washington	COTTAGE GROVE MERCURY RESPONSE Cottage Grove, Oregon	Figure 1 SITE VICINITY MAP		
	0 2.25 Approximate Scale in Miles	Date: 3/23/16	Drawn by: AES	10:START IV\16030004\fig 1

Spill Location

Soil Samples*

*sample locations are approximate

Figure 2
Site Layout

Cottage Grove, Oregon

ecology and environment, inc.
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100 50 0 100 Feet

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